

Otrzymano: 2007.02.19
Zaakceptowano: 2007.09.30

Gallstone ileus – a rare complication of cholecystolithiasis: a case report

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Summary

Background:

Gallstone ileus is a rare, serious and usually specific to elderly age complication of cholecystolithiasis associated with very high mortality. It occurs when a concrement from the gallbladder becomes incarcerated in the lumen of the digestive tract. In this report, a case of gallstone ileus is presented, where a concrement moved through a cholecystoduodenal fistula to the lumen of the small intestine.

Case report:

A 80-year-old woman who suffered from cholecystolithiasis and diabetes mellitus was admitted to hospital with abdominal pain, flatulence and loss of appetite which lasted a few days. In ultrasonography of the abdomen, a gallbladder hydrops was found and the patient was qualified to cholecystectomy. The night before the planned surgery, the patient reported her abdominal complaints to more intense, and vomiting occurred. Abdominal ultrasonography was repeated, revealing wide intestinal loops with the gallbladder poorly visible; the examiner also noticed a hyperechogenic shadow in the stomach and in conclusions suggested the possibility of perforation. In CT imaging, one concrement in the jejunum and several ones in the colon were found to confirm the diagnosis. During the surgery, perforations of the gallbladder and pylorus were found and a gallstone wedged in the lumen of the jejunum blocking the passage.

Conclusions:

Cholecystolithiasis, as a disorder common in our population, should be considered in differential diagnosis of intestinal obstruction. Gallstone ileus as a rare but highly dangerous complication of cholecystolithiasis is more often seen in elderly patients with rich medical past. None of radiological methods used separately is able to give a full diagnosis – only their combination leads to an accurate diagnosis. That is why only rapid and well selected path of imaging diagnostics (ultrasonography, plain abdominal radiogram, CT imaging), good anamnesis and cooperation with a clinician is the way to obtain a therapeutic success.

Key words:

gallstone ileus • gallbladder hydrops • cholecystoduodenal fistula • ultrasonography • CT imaging • plain abdominal film

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Background

Intestinal obstruction leads to disturbance of one of the most essential and complex processes occurring in the living organisms – digestion and passage of gastric and intestinal content.

Intestinal obstruction can develop as a result of two mechanisms. The first one involves functional, or adynamic obstruction due to hyperexcitation of the sympathetic system (e.g. postoperative), whereas the second one is mechanical in character and may be due to a factor occluding or compressing the intestinal lumen (so-called

simple obstruction), or to strangulation by the mesenteric blood vessels (so-called strangulation obstruction).

Gallstone ileus, described for the first time by Bartholin in 1654, is a special form of intestinal obstruction. It develops as a result of gallstone passage from the gallbladder to the gastrointestinal tract, where it is trapped in the intestinal lumen.

Bouveret syndrome is a very rare form of obstruction caused by a gallstone wedged in the duodenal lumen and impairing gastric emptying process.

The aim of the paper is to present an interesting case of a female patient diagnosed on the basis of imaging studies with a complication of cholecystolithiasis, i.e. gallstone ileus, due to concrement passage into the small intestine through a cholecystoduodenal fistula.

Case report

An 80-year-old patient was admitted to the Department of General, Endocrine System and Transplant Surgery of the Medical University of Gdańsk because of abdominal pain, flatulence and loss of appetite which lasted a few days. Anamnesis revealed long-term history of cholecystolithiasis and type II diabetes. Other medical history of the patient was non-contributory.

Laboratory tests revealed no significant deviations from the reference values except for leukocytosis (15.000 mm³).

Abdominal USG revealed markedly enlarged gallbladder (120x72 mm) containing concrements of different sizes (the largest one up to 30 mm in diameter). The gallbladder wall was thickened (up to 5 mm in some places). No fluid was detected in the vicinity. No distension of the bile ducts was noted. The other abdominal organs did not demonstrate the presence of any detectable pathology.

The patient was qualified for cholecystectomy. In the night preceding the surgery, the patient started to complain of diffuse abdominal pains, increasing in severity, nausea, vomiting, and flatulence.

Physical examination revealed temperature increased to 38.7°C and clinical signs of intestinal obstruction.

Increasing leukocytosis (20,000 mm³) was observed in laboratory tests.

The patient was urgently referred to the USG department for repeated examination of the abdomen.

Ultrasonographic assessment of abdominal organs was difficult because of markedly distended atonic intestinal loops with liquid content and free gas in the peritoneal cavity. The examination failed to visualize the hydrps-affected gallbladder. At its typical location site, hyperechogenic structures which might have corresponded to a cluster of concrements were visible. Intrahepatic bile ducts were not distended. No significant amount of free fluid was found in the peritoneal cavity.

A single hyperechogenic area with regressive echo disappearance in the lumen of the stomach filled with liquid content was noted by the investigator (fig. 1).

The presentation of other abdominal organs was the same as on admission.

The results indicated a possibility of gallbladder wall perforation with formation of a cholecystoenteral fistula, through which some gallbladder might have passed to the intestinal lumen, causing secondary obstruction.

After surgical consultation, planned plain radiography of the abdomen was abandoned because of the aggravating condition of the patient. Abdominal CT was recommended.

Before the investigation, ca. 4500 ml of liquid gastric content was evacuated from the stomach using a gastric tube.

Abdominal CT revealed a gallbladder with no clear lumen visibility, shrunken, with obscured contours. In the gallbladder neck, a single, small gas bubble was visualized (fig. 2), in the jejunal lumen – a gallstone 30 mm in diameter (fig. 3). Smaller gallbladders were also present in the colon, at the level of splenic curvature. No concrements were found in the gastric lumen.

Additionally, the scan revealed free gas present in the peritoneal cavity, 3 cm fluid layer in both pleural cavities and interstitial densities in pulmonary segments 9 and 10 bilaterally.

The patient was subjected to emergency surgery.

After laparotomy, purulent content of the peritoneal cavity was found, as well as the gallbladder affected by an inflammatory process and perforated in the cholecystic body. Another perforation was seen on the anterior wall of the pylorus. In the jejunum, ca 100 cm from the Treitz ligament, a gallstone of 50x30 mm dimension was wedged, blocking the intestinal passage. No calculi were found in the gastric lumen.

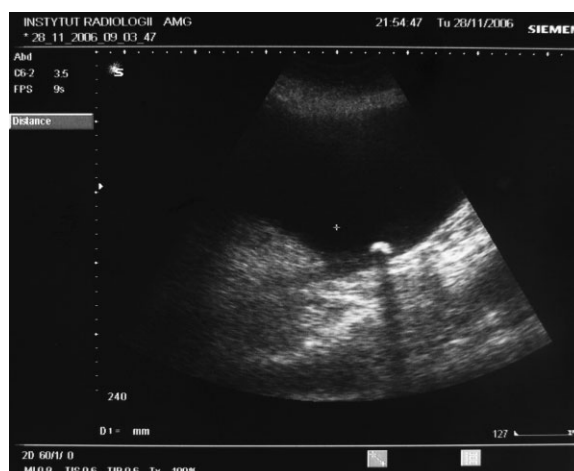


Figure 1. Ultrasonography of the abdomen. A hyperechogenic shadow with the retrograde echo extinction in the lumen of the stomach.

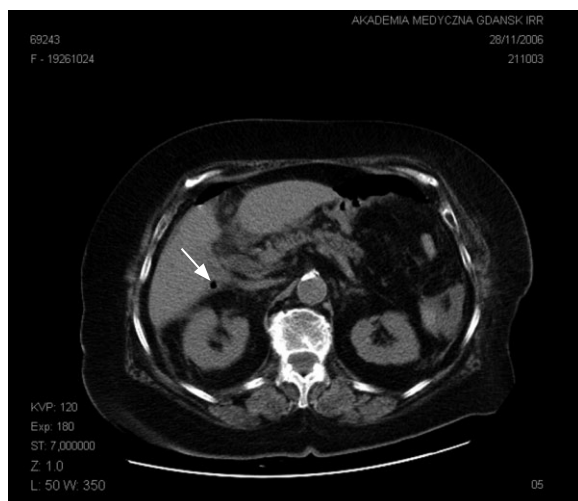


Figure 2. CT imaging. A gas bubble near the gallbladder neck (arrow).

The procedure involved dissection and resection of the gallbladder. The pyloric perforation was closed and the calculus was evacuated from the jejunal lumen.

On the third postoperative day, flushing and slight engorgement of the surgical wound margins appeared and the patient's temperature increased to 38.6°C. After loosening the suture, purulent discharge was obtained. A drain was placed in the wound. The patient was discharged home 29 days after the surgery in good general condition.

Discussion

Cholecystolithiasis is one of the most common abdominal disorders, affecting 10-15% of Polish population (F:M=3:1), whose incidence increases with age (it is observed in almost half of the population over 60 years of age). The gallstones become symptomatic only in 25% of patients. However, as many as 15% of patients affected by cholecystolithiasis die.

The complications most often reported in patients with gallstones include acute or chronic cholecystitis, gallbladder hydrops, empyema, or gallbladder wall perforation resulting in ectopic location of the calculi.

Perforation of gallbladder wall to free peritoneal space, pericholecystic space, or with formation of a cholecystoenteral fistula connecting the gallbladder with the gastrointestinal tract may occur.

The most common location of cholecystoenteral fistulas include cholecystoduodenal (60%), and slightly less frequent cholecystocolic ones, whereas cholecystopyloric fistulas (such as in the reported case) are rare [1].

Gallstone ileus is a rare complication of cholecystolithiasis (observed in 0.3-0.5% of patients with the primary disease) [2]. It accounts for 1-4% of all cases of mechanical obstruction of the small intestine. However, among patients over 65 years of age, gallstones are the cause of 25% obstruction cases [1, 2, 3].



Figure 3. CT imaging. A calcified concrement in the lumen of the jejunum (arrow).

due to their passage through natural pathways (common bile duct), or through a pathologic fistula. According to Lassandro et al., they cause mechanical obstructions and require surgical intervention in less than 50% of cases. Most of them are excreted in a physiological way – with feces [2].

Literature data indicate that the accuracy of diagnoses of intestinal obstructions by gallstones established preoperatively ranges between 10% and 44% [3, 5, 6, 7]. Numerous authors report additionally that the mean time elapsing between the onset of first obstruction symptoms and hospitalization ranges from 3 to 5 days [3, 8, 9]. The most common location where the gallstones are trapped is the ileocecal junction. However, gallstones wedged in the duodenum, as well as in the colon, have also been described [2].

Mean size of the calculi causing gallstone ileus ranges between 20 and 50 mm (the largest calculus described was 17,7 mm long) [1, 2, 4, 10]. However, gallstones below 25 mm in diameter are considered not to cause mechanical obstruction in most cases [2].

Severe gastrointestinal tract obstruction due to gallstone trapping in the duodenal bulb, leading to liquid gastric content retention (described for the first time by Bouveret in 1896) is an extremely rare form of the disorder (referred to as Bouveret syndrome) [1, 11].

In the reported case, the initial findings could have indicated the presence of Bouveret syndrome (considerable gastric content retention, a concrement shadow visible in the gastric lumen). However, the absence of any calculi in the duodenum excludes such diagnosis.

Radiological diagnostics constitutes an integral part of accurate diagnosis in patients with suspected intestinal obstruction developed as a complication of cholecystolithiasis.

The techniques available currently for radiologists include plain radiography, ultrasonography, computed tomography and magnetic resonance imaging.

Plain radiogram of the abdominal cavity is still the primary tool in the diagnostics of intestinal impatency.

The symptoms described by Rigler in 1941, such as the presence of air in the bile ducts, impatency of the small intestinal loop and a concrement wedged in the intestinal lumen (so-called Rigler's triad) were thought to indicate obstruction due to cholecystolithiasis. However, it is reported in the literature that the concurrence of all three symptoms in plain abdominal radiograms ranges from 0% to 87% [3, 4, 5, 12, 13].

Abdominal ultrasonography is often used in the diagnostics of intestinal obstruction causes. However, some authors (Freitag et al.) report that USG allows the diagnosis of gallstone ileus only in 2/3 of cases [1, 14].

The symptoms indicating the presence of gallstone ileus seen on USG include intestinal wall edema, fluid in the peritoneal cavity, gas in the bile duct, or concrement shadows in the intestinal lumen [15].

The ultimate method used in the diagnostics of gastrointestinal tract obstruction is computed tomography (CT), offering a considerably larger potential for determination of etiology of intestinal passage disturbances.

If gallstone ileus is suspected, CT (in comparison with the methods discussed above) allows more accurate determination of number, size and localization of ectopic concretions, as well as detection of those not trapped in the intestinal lumen yet. Additionally, oral administration of contrast medium makes it possible to localize accurately the cholecystoenteral fistula.

In the cases of intestinal impatency caused by gallstones, the expected CT findings will include gas distension of the bile ducts, the presence of a cholecystoenteral fistula, intestinal

wall edema, fluid in the intestinal lumen as well as in the peritoneal cavity, and ectopic location of calcified concretions.

In the reported case, computed tomography allowed to determine the number, size and localization of gallstones. Because of poor general condition of the patient (considerable retention of gastric content), oral administration of contrast medium was contraindicated, which could have been the reason for failure to visualize the cholecystoduodenal fistula.

In the opinion of many authors (also supported by our team), the use of CT allows to reduce the time of diagnostics of the obstruction cause, as well as facilitates the choice of optimal methods of treatment [2, 15].

Used separately, the diagnostic methods presented above may be insufficient to establish an accurate diagnosis addressing the cause of gastrointestinal tract obstruction. Only their combination and cooperation of the team of clinicians and radiologists allows to obtain a reliable diagnosis.

Conclusions

Cholecystolithiasis, as a disorder very common in our population, should be considered in differential diagnosis of intestinal obstruction.

Gallstone ileus, which is a rare but highly dangerous complication of cholecystolithiasis, is more frequently observed in elderly patients with rich medical history. None of radiological methods used separately is able to give an accurate diagnosis. That is why only rapid and well selected path of imaging diagnostics (ultrasonography, plain abdominal radiogram, CT imaging), good anamnesis and cooperation with a clinician is the way to obtain a diagnostic and therapeutic success.

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